

REMARKS/ARGUMENTS

Claims 1-11 and 13-23 are active.

Claim 1 is amended to specifying the content of anionic monomer units in the anionic polymers to 5 to 30 wt.-%. Claim 4 is amended to define 10 to 20 wt.-%. Both amendments are described in the application at page 5, 2nd paragraph.

Claim 1 is also amended to include the definitions from claim 12, which is described in the specification at page 6, 2nd paragraph.

Claim 23 finds support on page 4, 3rd paragraph, the paragraph bridging pages 4-5, and page 11, polymers E and F.

No new matter is added.

By way of background and to understand the invention, the invention provides dewatering of sludge from rivers and harbors and sandbanks or sea floors, a method that permits rapid and cost effective dewatering and that can be achieved as simply as possible in the existing field-dewatering systems. In view of the high velocities of transport of the sludge and the associated high sheer loads, the method can lead to rapid flocculation and stable flocs. In particular, the method will be advantageously usable even for sludges that are particularly difficult to dewater because of their high content of particles (see US 20070138106, [00091]). An important aspect, with a view to subsequent use of the dried sludges, is that environmentally hazardous products be avoided (See US 20070138106, [0010])

Another object of the method is to minimize the time for natural drying of the partly dewatered sludge remaining after separation of the supernatant water and of the drainage water. A further object of the invention is to bind the hazardous substance present in the aqueous sludges so strongly to the dewatered sludges that subsequent addition of substances

for binding hazardous substances can be reduced or avoided and the dried sludges can be directly further processed or dumped (cf. US 20070138106, [0011]).

Surprisingly, it has been found that the flocs produced according to the inventive method are very stable, and thereby destruction of already formed flocs by friction affects during sludge transport is prevented (See US 20070136106, [0030]).

It has been also surprisingly found that the time advantages achieved by the inventive method are considerable (See US 20070138106, [0033]).

Further, it has been surprisingly found that the partly dewatered sludge obtained after separation of supernatant and drainage water exhibits only a slight tendency to reabsorb newly arriving water and, thus, the weather-related prolongation of the natural sludge drying is greatly reduced (see US 20070138106, [0037]).

Still further, it has been surprisingly found that advantageous flocculation with respect to clarity, volume of clarified water and clarity is achieved with a water- soluble, anionic, polymeric flocculating agent that contains from 5 to 30 percent by weight of anionic monomer units (see below)

It has been also surprisingly found that method for dewatering of sludge can be applied to sludge having a density of 1.04 to 1.15 metric tons per m³ (see below).

The advantages of the method according to the invention are illustrated by the experimental results disclosed in the present application. The results of examples 1 and 2 are shown in the following table (See US 20070138106, [0057]-[0059]):

anionic polymer	wt.-% of anionic monomers	Volume of clarified water after addition of 40 mL of polymer solution	Volume of clarified water after addition of 80 mL of polymer solution
<i>inventive polymers:</i>			
E	10 wt.-%	240	260
F	15 wt.-%	260	220
<i>comparative polymers:</i>			
D	1.5 wt.-%	210	270
G	40 wt.-%	25	10

It can be seen from the table that the inventive examples E and F (5 to 30 wt.-% of anionic monomer units) provide a higher volume of clarified water per minute (240 and 260 mL, respectively) at low concentrations (40 mL) in comparison to the comparative polymers D and G at the same concentration (210 and 25 mL, respectively).

For the comparative anionic polymer D (c5 wt.-% anionic monomer units), the volume of added polymer D solution has to be doubled to 80 mL in order to reach a similar efficiency that the inventive polymers E and F display already at a concentration of 40 mL. For the comparative polymer G (>30 wt.-% of anionic monomer units), the efficiency is significantly lower than that of the inventive polymers E and F independently of the concentration.

Similar conclusions can be drawn from the results of example 3, which are shown in the following table (See US 20070138106, [0060]):

anionic Polymer	wt.-% of anionic monomers	Time [sec] for 200 mL of filtrate after addition of 100 g of dry substance	Time [sec] for 200 mL of filtrate after addition of 300 g of dry substance
<i>inventive examples:</i>			
E	10 wt.-%	6	15
F	15 wt.-%	6	31
<i>comparative examples:</i>			
D	1.5 wt.-%	18	5
G	40 wt.-%	11	102

Summing up, the use of water-soluble, anionic, polymeric flocculating agents that contain from 5 to 30 percent by weight of anionic monomer units display high efficiency at low concentrations of polymer:

- compared to anionic polymers with <5% anionic monomer units, the concentration of the inventive polymers can be significantly lowered to obtain similar results; and
- compared to anionic polymers with >30 wt.-% of anionic monomer units, the inventive polymers are at any concentration significantly more efficient.

The results of the above experiments further demonstrate that the method according to the invention can be applied to sludge having a density of <1.15 metric tons per m³. In this respect it should be noticed that the sludges used in the experiments summarized above display densities of 1.066 (sludge sample 1) and 1.062 metric tons per m³ (sludge sample 2).

These results prove that sludges with densities <1.15 metric tons per m³ are successfully treated by the instantly claimed method.

Claims 1-13, 15, 18, 19, 21 and 22 are rejected as being obvious based on Condolios and Baize; Claim 14 is rejected as obvious based on Condolios and Baize further in view of Pickering; Claims 16 and 17 are rejected as being obvious based on Condolios and Baize further in view of Grimm; and Claim 20 is rejected as being obvious based on Condolios and Baize further in view of Iji.

These rejection are not sustainable as the cited art, singly or in combination, do not suggest adjusting the concentration of the sludge to a density of 1.04 to 1.15 metric tons per m^2 nor that the polymeric flocculating agent contains from 5 to 30 percent by weight of anionic monomer units (see Claim 1). As such, a *prima facie* case of obviousness has not been established. Further, while the rejections alleged that the claims are simply optimizations, such cannot be the case where “the parameter optimized was not recognized in the prior art as one that would affect the results.” See *Ex parte Whalen*, Appeal 2007-4423 (BPAI 2008, precedential). Further, the rejections are not sustainable in view of the surprising advantages of the claimed process, outlined above and presented in the specification.

As already acknowledged in the rejection, Condolios does not describe anionic polymeric flocculants, nor that the content of the anionic monomer units is important to the performance as defined in Claim 1. Further, there is no hint in Condolios that the sludge density is important, and certainly not the sludge density of 1 .04 to 1 .15 metric tons per m^3 as defined in Claim 1.

Baize discloses anionic polymers amongst others, but contains no teaching that the content of the anionic monomer units or the sludge density are important to the performance as has been shown in this application.

Notwithstanding these deficiencies, the rejection purports that the claims still would have been obvious because it “would have been an obvious matter of process optimization to

one skilled in the art, depending on the specific sludge treated and results desired, absent a sufficient showing of unexpected results.” (see page 2 of the Action).

Applicants respectfully disagree.

As noted in a precedential opinion issued by the Board of Patent Appeals and Interferences in *Ex parte Whalen (Id.)* [w]hile ‘the discovery of an optimum value of a variable in a known process is normally obvious,’ *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977), this is not always the case.” *Ex parte Whalen* at page 14. The Board further explained that “[o]ne exception to the rule is where the parameter optimized was not recognized in the prior art as one that would affect the results.” *Id* at page 14.

Therefore, applicable in the present application, Applicants submit that “the Examiner has not pointed to any teaching in the cited references, or provided any explanation based on scientific reasoning, that would support the conclusion that those skilled in the art would have considered it obvious to “optimize” the prior art [methods].” As the Examiner has not explained why one of ordinary skill in the art would have had reason to optimize the methods of Condolios and Baize, when in fact both citations are completely silent on the features of density and percent of anionic monomer units, the art cited does not establish a *prima facie* case of obviousness. On this basis alone, Applicants request reconsideration and withdrawal of the rejection combining Condolios and Baize.

Further, Applicants have provided (and explained in detail above) comparative data demonstrating why the claimed process yields surprising effects, not at all suggested by the combined teachings of the cited art. Therefore, on this basis as well, Applicants request withdrawal of the rejection combining Condolios and Baize is requested.

The separate rejections that combined Condolios and Baize further in view of Pickering; Grimm; or Iji are also not sustainable because none of these citations describe or

fairly suggest the sludge density, the percent of anionic monomer content, and the surprising advantages that result from the Applicants discovery.

Further, the citation of Iji teaches one not to do what the Applicants have done in terms of sludge density. Iji discloses that the sludge is adjusted to a specific weight of 1.15 to 1.35 by the addition of water, Iji explicitly states that a specific weight lower than 1.15 decreases the treatment efficiency with an increase in the amount of the sludge to be treated due to dilution (Iji, column 9, lines 21-28). Further, Iji discloses that the clogging of the filter fabric is suppressed by adjusting the specific weight to 1.15 to 1.35, (Iji, column 2, lines 63-67). see MPEP § 2141.02 (prior art must be considered in its entirety, including disclosures that teach away from the claims) and also *Ex parte Whelan*, *Id* at 16: “when the prior art teaches away from the claimed solution as presented here. . . obviousness cannot be proven merely by showing that a known composition would have been modified by routine experimentation or solely on the expectation of success; it must be shown that those of ordinary skill in the art would have had some apparent reason to modify the known composition in a way that would result in the claimed composition.”

For the reasons explained above, withdrawal of the rejections applied under 35 USC 103(a) is requested.

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A Notice of Allowance is also requested.

Respectfully submitted,

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